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ABSTRACT

This manual is designed to introduce adults to microcomputers. It is planned for use with a series of five two-hour labs on Apple II or IIe computers, with participants expected to review sections and practice on a microcomputer between sessions. The goals are to have participants (1) understand how programing languages work, (2) understand the power and purpose of three types of software (word processing, electronic spreadsheets, and database management), (3) determine what skills they want to develop next, and (4) realize how much fun the computer can be. Helpful vocabulary is listed first, followed by sections on an introduction to Logo, word processing for the author, an introduction to BASIC, electronic spreadsheets, and database management. Each describes the purposes and what to do in some detail. A brief bibliography is also included. (MNS)

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INTRODUCTION

This manual is designed to introduce adults to microcomputers. It is planned to be used with a series of 5 2-hour labs on Apple II or IIes. Participants are expected to review sections between labs and to practice on a microcomputer between sessions if possible.

Although the instructions in this manual are for the Apple II and IIe, similar programs are available on other microcomputers. We hope that participants will

a. understand how programming languages work

b. understand the power and purpose of the three most commonly used types of software (word processing, electronic spreadsheets and database management)

c. be able to determine what skills they want to develop next

d. realize how much fun the computer can be.

Although each section of the manual can be used independently, we have found that the sequence used here (Logo, Word Processing, BASIC, Spreadsheets, Database Management) builds logically over the 5 sessions. For participants who want to learn more about any (or all) areas, the Collaborative has longer manuals available on each topic and there are many new books and journals being published. A bibliography is included at the end of this manual.

VOCABULARY

More than half the fun of using microcomputers is to learn all the new words. Terminology will be introduced throughout this manual as it is needed, however, there are a few vocabulary words that will be helpful at the beginning.

KEYBOARD — On the Apple the keyboard is in the same box as the Central Processing Unit (the chips that make the computer work.) In some other microcomputer, the keyboard is connected to the computer by a cord or a electronic signal. Apples use only the QWERTY keyboard (named for the top right row of letter keys.) Some microcomputer have an additional numeric keypad (like an adding machine) and additional function keys (keys that perform certain commands).

MONITOR — The TV-like screen. In most microcomputers, this unit is separate so that you can adjust it. The monitor should be no higher than you eyes (lower if you wear bi-focals. Move it. Contrast and color intensity can be adjusted to avoid eye strain. Find the knobs and try different settings. Monitors are also called CRTs (Cathode Ray Tubes) and VDTs (Video Display Terminals.)

DISK DRIVE — This unit reads information stored on mylar disks. You may have one or two drives. If you have two, they may be in one box or in two separate boxes. Other microcomputers have the drives in the same unit as the monitor, or the Central Processing Unit (CPU) or the keyboard. Look inside the drive while you open and close the door. Do you see a plastic unit come down? When you close the drive door, it grabs the center of the disk and turns it around so that the information on the disk can be read into the computer's active memory (RAM or Random Access Memory.)

DISK — The disk (sometimes called diskette or floppy disk) that goes into the disk drive is made of mylar. It can be damaged with dust, cigarette smoke, coffee, peanut butter, cold, neat and magnets. If you are hoping that this manual will provide you with the one true rule for effective use of the microcomputer, your prays are about to be answered: Take care of the disks. (It may be boring, but it is true.)

PRINTER — If you have a printer connected to your computer, you will be able to get "hardcopy" (a paper copy) of your work. Printers have their own plugs and rules. In general, make sure that the paper is feeding properly and don't leave printers unattended.

AN INTRODUCTION TO LOGO

LOGO

Logo is an interactive language originally developed to study problem solving and to give children access to the power of the computer. In its early stages, Logo had a mechanical robot (turtle) which could be directed around the floor. A pen was attached to the turtle so that the children could direct the turtle to draw patterns. Like youth itself, Logo is too much fun and too stimulating to be saved for children.

There are many excellent books and articles on Logo, some of which are listed in the bibliography. Since almost every microcomputer has a Logo, or Logo-like, program, it is important to select manuals that can be adapted to your form of Logo. The following directions are designed for use with the MIT version of Logo for the Apple II or IIe. (This version is sold by Terrapin and Krell.) There need to be slight adjustments for Apple Logo, for Terrapin Logo on the Commodore and for the other versions for TI, the Color Computer, the IBM etc.

1. LOADING LOGO

The Logo language is on a disk. Put the disk in the drive (label in front and facing up); close the disk drive door; turn on the Apple (back left-hand side); turn on the monitor. If all goes well, you should see some copyright information on the screen in about 40 seconds. If nothing is happening on the screen and the disk drive light is not on, check all plugs and connectors, take the disk out of the drive and start at the beginning of the paragraph. If that doesn't work, check the manual or find someone to help you.

You can now put away the Logo disk. (Storing disks carefully in dust free, non-magnetic environments is essential to the continued effective use of the microcomputer.) For this introduction we will not be saving work so you will not need an an initialized file disk.

2. DIRECT COMMANDS

Logo has a series of commands which will let you direct the turtle around the screen. Begin by typing ST (or the longer version of the same command SHOWTURTLE). Press RETURN. That triangular light point on the screen is the turtle. Impressed?

Send the turtle forward by typing FD 80 (if you would like to type out the longer version of the same command, type FORWARD 80). And press RETURN. If the turtle goes forward 80 units leaving a line behind it, you are doing fine. If the computer has just typed: I DON'T KNOW HOW TO... , you will need to retype the line. This time make sure that there is a space between the D and the 8 and that you use the zero instead of the letter O.

Turn the turtle by typing RT 60 (or RIGHT 60). Press RETURN. Notice that the turtle didn't go anywhere, it just changed direction. The 60 represents a rotation of 60 degrees.

Go forward again: remember you need the command FD, a space, a number of units and, finally, press the RETURN key.

Spend some time moving the turtle around. Try closing the figure you have started, or send it exploring the monitor space. If you get confused and want to start again, typing DRAW (and pressing RETURN) will clear the screen and send the turtle home (to the center of the screen and heading north.)

When you have given the turtle at least a dozen FORWARD and RIGHT commands, here are some others that increase the turtle's capabilities:

FORWARD ##	FD ##	forward number of units
BACK ##	BK ##	backward number of units
RIGHT ##	RT ##	rotate right number of degrees
LEFT ##	LT ##	rotate left number of degrees
PENUP	PU	lift pen up, turtle can be moved without leaving a line
PENDOWN	PD	put pen down, turtle will leave a line
DRAW	DRAW	clears screen, turtle goes to center of screen, heading north
CLEARSCREEN	CS	clears screen, turtle does not move
HOME	HOME	sends turtle home, does not clear the screen
BACKGROUND #	BACKGROUND #	sets background color, range 0 to 5
PENCOLOR #	PC #	sets pen color, same range some colors don't work together
HIDETURTLE	HT	triangular light point disappears from screen
SHOWTURTLE	ST	triangular light point returns to the screen
FULLSCREEN	CTRL/F	shows design at bottom of screen where text usually is
SPLITSCREEN	CTRL/S	four lines of text at bottom of screen
TEXTSCREEN	CTRL/T	entire screen for text

Spend at least a half hour trying these commands. If you have a color monitor changing the colors is fun since designs look quite different in different combinations of color. Try drawing your intials (PU is very helpful here.)

Note: To erase a letter, get to the right-hand side of the incorrect letter by walking over it with the right-hand arrow and attack it with the ESC key. If you need to use a CTRL (control) key, hold down the CTRL key with one hand while pressing the other key with the other hand. It is very helpful to "play turtle." Direct yourself or someone else to make the pattern as they walk around the room. Playing turtle is especially helpful when deciding between LEFT and RIGHT commands.

3. PROCEDURES

So far you have been giving direct command to the computer. There are also some interesting uses of small program units, called procedures in Logo. For example, what commands would you give the turtle to have it draw a box? There are obviously a number of alternative commands depending on whether you use FORWARD or BACK and whether you use RIGHT or LEFT and whether you draw and then turn or turn and then draw. One possible set of commands would be:

```
FD 50 RT 90
FD 50 RT 90
FD 50 RT 90
FD 50 RT 90
```

Let's turn this into a procedure. Type TO BOX and watch the screen when you press RETURN.

If all goes well, you are now in the edit mode (really a little word processing program for Logo), you have lost the question mark prompt and at the bottom of the screen are commands telling you how to get out of the edit mode. Type in the information you need to have your screen look like this.

```
TO BOX
FD 50 RT 90
FD 50 RT 90
FD 50 RT 90
FD 50 RT 90
END
```

If you make mistakes, use the ESC key, or you have additional editing commands available only on this screen (the edit mode):

CTRL/P will move the cursor to the previous line
CTRL/N will move the cursor to the next line
CTRL/D will erase the letter under the cursor

When you have finished your procedure, press the CTRL (control) key with one hand, and while hold it down, press the C key.

You should be back to the ? prompt (graphics mode) and at the top of the screen should be BOX DEFINED. You have just taught the computer a new command (BOX). Congratulations. Now see it the computer really knows the command, type BOX (and press RETURN.) The turtle should have drawn a box for you. If the computer did not do that, it probably told you of some kind of problem in your procedure, type EDIT BOX, proofread your procedure carefully, make any changes necessary, press CTRL/C again and, once again, type BOX (and press RETURN).

There is, of course, an easier way than repeating the same set of commands four times. Let's do a new procedure to draw exactly the same box. With the ? prompt showing on the screen, type TO NEWBOX. When you are transferred to the edit mode, type in the following procedure:

```
TO NEWBOX
REPEAT 4 [FD 50 RT 90]
END
```

(Make sure you are using brackets not parentheses. These will be easy to find on the Apple IIe; on the Apple II and IIplus, the left hand bracket is SHIFT/N and the right hand bracket it SHIFT/M.)

How do you get back from the edit mode to the graphics screen?
(Right, press CTRL/C)

How do you get the turtle to draw the new procedure?
(Right, type NEWBOX and press RETURN)

Use the ability to write procedures and the convenience of the repeat command to create other designs. Try other closed figures, or repeated open patterns like stairs across the screen, or a pattern of short and long lines. What about a circle? Remember to try to think of yourself as the turtle. What directions would you, the turtle, need to draw a certain pattern.

4. SUBPROCEDURES

One of the most exciting capabilities of Logo is using one procedure when creating another procedure. It allows the programmer to develop small working units which can then be used together to solve more complex problems. Papert calls this breaking down the problem into "mind sized pieces."

For example, let's turn our NEWBOX into a FAN. (If you have turned off the computer between sections 3 and 4 you will need to type NEWBOX back into the computer.) With the ? prompt on the screen, type TO FAN, press RETURN and you should find yourself in

the edit mode.

```
TO FAN
REPEAT 36 [NEWBOX RT 10]
END
```

What do you think the procedure will do? Stop. Take out pencil and paper and draw out first the box, turn the turtle, draw a second box, turn and draw again. What will the pattern look like when it is finished? Let's test your hypothesis: leave the edit mode (if you can't remember how, check the previous section) and run the new procedure (again if you can't remember the command, check the previous section.) Did it do what you expected? If not, spend time re-running the procedure and listing it. If you want a slower form, type TRACE and then FAN. You will have to press RETURN between every step. When you are finished, type NOTRACE.

When you are fairly certain you that understand what happened, try building other multiple level procedures.

5. VARIABLES

You can have more flexibility in using a procedure you have developed if you can change some of the values each time you use the procedure. In Logo a variable is a name which begins with a semi-colon, for example, :length (read as "dots length"). You can use any name that makes sense to you for the variable except Logo primitives (words like FORWARD and RIGHT). To develop a procedure for a box of undetermined size, type TO SQUARE :SIDE (and press RETURN)

```
TO SQUARE :SIDE
REPEAT 4 [FD :SIDE RT 90]
END
```

This procedure tells the computer the commands for a procedure called SQUARE and to save a space labelled :SIDE in the memory of the computer for a number, the value of which it will be told later.

After you have returned to the graphics screen (CTRL/G), you must type both the word SQUARE and the value of the side

```
SQUARE 50
```

Try it again without clearing the screen with

```
SQUARE 30
SQUARE 70
```

Make sure you understand why you are typing in the number. Write another procedure with one or more variables.

4. MORE

There is so much more to Logo: Saving and loading program, printing procedures and pictures, using recursions, using formulas and assignment statements, using list processing. This is only an introduction. You have months, even years, of Logo capabilities to explore.

Logo seems to generate wonderful books and exciting organizations. There are a number of national networks of Logo users listed in the bibliography. There publications are always interesting. Educational computing journals often have special issues devoted to Logo. Logo has influenced both the design of other computer languages and the practice of teaching about computers. There are a number of introductory Pascal manuals which use a turtle-like robot to introduce programming concepts and language structure.

WORD PROCESSING FOR THE AUTHOR

The Process of Processing Words

Just as electronic spreadsheets sold personal computers to the business world, so word processing programs are selling personal computers to writers. One little mylar disk gives the writer (teacher or student) access to a publishing house: a secretary, and editor, and a a typesetter. It is wonderful. Or almost wonderful. There are a few small problems: hardware, software, keyboarding skills, and the ability to proof and edit so that the last version is better than the first. But, after all, how much can one realistically expect from one little mylar disk?

WHICH COMPUTER? WHICH PROGRAM?

Word processing programs are available for all microcomputers. In order to use your computer for word processing, however, you need the program (on disk, tape, cartridge or built into the chips), storage capabilities (a disk drive or cassette tape player) and a printer. When you are purchasing equipment for word processing make sure that the components will work together and that you have all the connecting pieces (cables and interface cards.) Interface cards are quite expensive; be sure to figure the card and cables into the total price.

Most microcomputers have more than one word processing program available. Some have dozens. If you want to keep up with the changes, read INFOWORLD every week. Try to select a program which is designed to help with your kind of writing (if you never send form letters, you have no need for mail-merging capabilities.) There are certain common traits in programs which can be used as criteria in selecting the program which meets your needs.

THE MAIN CHARACTERS

The Main Menu: Most word processing programs start on the Table of Contents or Main Menu. The writer is usually given the choice of beginning to write, loading a previously written document from a file disk, setting up the way the page will look (format), changing the configuration (the type of printer or number of disk drives the program expects), or printing what has been written. Often there are additional sub-menus which allow even more choices within each major function. Some programs display the menu at the top of the screen (Bank Street Writer and Word Star are probably the two best known.) HomeWord displays the menu at the bottom.

An ideal menu uses easily understood words, reminds the user what combination of keys to use to make the choice and is accurate. That last criteria may seem obvious, but some versions of Word Star list uses for keys which don't exist or fail to tell about the functions of keys which do exist. If the program has a Main Menu, you will always have to return to it to move to the different submenus (or subsystems). It is a bit like coming back to the main corridor before entering the next room.

The Cursor: When the writer has made whatever choices are necessary to begin writing, a screen will be blank except for some status lines or sub-menus at the top or bottom of the screen. Somewhere near the top left corner is a cursor (flashing box or line) which tells the writer where the next letter will be typed. The cursor may seem insignificant, but like the co-worker who hums tunelessly all day, a badly designed cursor can drive you crazy.

The cursor is especially important during the editing process when the writer is moving backwards through the text. Some of the older programs have flesh and bone cursors that take a space between two letters, forcing all the letters in the line to bounce apart creating incredible eye strain. The problem for the word processing designer is to make a cursor which the user can find on the screen, but to keep it unobtrusive. There are open boxes, flashing horizontal lines and vertical non-flashing lines. Some word processing programs use two colors which can cause eye strain.

SAVING FILES

If the writer can't save written material to work on later, there isn't much point in using a word processor. The word processing disk (or cartridge) is called The Program; the text you have written is called The File.

The file, or text, is saved either on cassette tapes or on disks. Disks are made in standard sizes (3 3/4, 5 1/4, 8 inch). Most personal computers uses 5 1/4" floppy disks. Although the disk size is standard, the organization of the disk (how many concentric circles, how many sectors per circle) varies with the microcomputer brand. Preparing the disk so that it can be used by your computer is called "initializing" or "formatting" the disk. If you want to store the text you have written, you must have an initialized disk. Directions for intializing are found in your computer reference manual and probably also in the word processing manual. If you are wise, you will initialize an extra disk so that when you find out late one night that you have used up all the space on your file disk "DISK FULL", you will have another disk ready to use. Ideally, the word processing program will let you initialize a disk without losing what you have written.

Back-up copies: Disk costs $3.00-$4.00 each. Making back-up copies of all your writing is, therefore, expensive. There is only one criteria for deciding whether or not to make a back-up copy. When the original disk is ruined and you have type it over again, how much will your time be worth?

PRINTING

A computer without a printer is a computer that cannot be used for word processing. If you have a computer in one place and an identical computer with a printer somewhere else, you can always save now and print later. But to be totally without a printer is impossible. Use the computer for pressing flowers.

Printers come in four general types: plotters, thermal, daisy wheel (and thimble) and dot matrix. Plotters are wonderful for engineers but not useful to writers. Thermal printers are slow, quiet, and inexpensive to buy (but expensive to run because they required special thermal paper.) Changes in the technology will soon allow thermal printers to use regular paper. They will then become much more popular.

Daisy wheel printers have a flat daisy-like head with letters where the petals should be; the center rotates knocking the petals against the ribbon. In the thimble version, the letters spring from the wide edge of the thimble to the ribbon. Daisy wheel printers produce copy that looks as if it had been produced by a typewriter and are, therefore, sometimes called "letter quality" printers. There are many different fonts (sets of characters.) Some daisy wheel printers are slow and noisy; the more the printer costs, the quieter and faster it will be. Daisy wheel printers cannot reproduce graphics and usually need more maintenance than the dot matrix printers.

Dot matrix printers have a set of little heads which jump forward onto the ribbon. Since there is space between the heads, there is a newspaper-picture quality of discrete dots to the print which some people find difficult to read. Dot matrix printers can usually be set so that each line is struck twice with the paper moving very slightly between the two passes, thus filling in the spaces. Dot matrix printers have excellent repair reputations. They are quiet, fast and will reproduce graphics beautifully.

PAPER FEED

During the final moments before printing (printer sub-menu), the writer has the option of indicating that the printer should stop at the end of each page so that new paper can be fed. The menu may say "single feed" or "pause between pages." Many printers allow both single feed and sprocket feed options.

Single, or friction, feed on computer printers works just the way it does on a typewriter. The platen (black cylinder) presses against the housing, the operator feeds the paper in and advances it with a knob or button. Friction pushes the paper along as the printing progresses. Friction feeding is slow (some printers have automatic feeding devices), but makes it possible to use fancy letterheads, ditto masters or special paper.

The sprocket feed system uses the holes along the edges of the paper to pull the paper through the printer. Paper for sprocket feeding usually comes fan-folded in a box. It is important to position the box so that the paper feeds straight into the printer. Since the friction feeding system pushes the paper through the printer and the sprocket feeding system pulls the paper through, make sure that both systems are not engaged at the same time or you will have crushed and tangled paper.

Printer configuration: Microcomputers can be used with most, but not all printers. Some printers need a "parallel printer port" (messages are sent to the printer in groups of 8, or one byte at a time): some printers need a "serial printer port" (messages are sent to the printer one at a time, or bit by bit). Theoretically parallel is faster, serial more flexible. The real issue is that they are different and you need to make sure that the two units will work together. Make sure that the dealer will promise you in writing that the brands will work together without additional cost. You will need an interface unit (usually an electronic board which goes inside your computer to connect the printer to the computer. If you want to use the graphic capabilities of a dot matrix printer, make sure that the card you buy is designed to do graphics (sometimes called graphics dumps.)

When you start using your word processing program, you will undoubtedly need to make some adjustments so that your word processing program will work with your printer. The manual or menu will usually list such adjustments as "configuration" or "utility." Remember when configuration meant a shape and utility was the electric light company?

THE KEYBOARD

CTRL: some day, somewhere, there will be a statue for the person who invented the control key. The control key is never used by itself, it is always used in combination with another key. That one key has the effect of doubling the size of the keyboard: The K may be is just a K, but a CTRL/K kills a line of text. Get in the habit of pressing the CTRL key first, then the second key; you will save hours of erasing letters you didn't mean to type. A CTRL/key combination never shows on the screen.

Qwerty keys: the letters of the alphabet were originally arranged on the typewriter so that the most commonly used letters

in the two semi-circles of keys (even I am not old enough to have used one of those) had the best shot at the paper. Much has been written about the craziness of keeping such a totally inefficient keyboard. It should be changed. Hold your breath. In the meantime, if you seriously want to use a word processing program and you do not know the hand positions for touch typing, learn them.

Numeric keys: most computers have a set of number keys at the top of the keyboard. Some computers have an additional set to the right of the Return key (numeric keypad) for the accounting people who are used to having a number pad. Usually the keypad can be used for a second purpose by releasing the Number Lock key.

Function keys: these keys that do something more (or less) than reproduce a letter or number. Sometimes these have names (DEL, RESET, ESC), sometimes they have numbers, sometime little symbols such as directional arrows. Word processing programs should be able to take advantage of all available keys. Unfortunately, the designers of word processing programs usually do not know what the keyboard of a new computer will look like when they are designing their programs, so some keys remain virtually unused. Worse still, when programs are re-written for different computers, the programmers don't bother to take advantage of the new keys. It seems silly to buy a fancy keyboard and then a program which doesn't take advantage of it.

Programmable function keys: some word processing programs allow you to specify that certain function keys (or combinations of CTRL and a key) can be used for commands you commonly use, such as underlining or printing out the long form of an abbbreviation. Those of us who do not use our word processing program all day, or who have terrible memories, need to post a chart of all the functions before they are lost forever.

Mnemonic: some word processing designers have made a noble effort to help the writer remember common commands by using easily remembered letters: I for insert, D for delete etc. Some designers seem to take perverse joy in linking keys to commands randomly: j for insert, l for delete, or maybe it was the other way around, I can't remember.

OPTIONAL COMMANDS

Clear: after you have saved what you have written, you may want to Clear that text so that you can start something else. This command erases the text from the active memory of the computer (the RAM). If you have not saved it, it is lost. After you select CLEAR, you are still in the word processing program. If want to leave the program completely, you should select QUIT.

80-column/40-column: the original personal computer screens had

space for forty characters (or 40 columns of letters) across the screen. A few computers, like the Vic-20 have even fewer columns. All business computers have 80 columns; some have the option of 120. Some computers can be converted from 40 to 80. Computers which use only a TV monitor (have the RF Modulator built in) cannot be converted to the smaller characters. There is no question that larger characters should be easier to read than small characters. However, the quality of the screen is more important. TV monitors are always awful. Any monitor designed exclusively for a computer is better. The resolution (the number of little dots, or pixels, used to make up each letter) is better on some computers than on others.

The advantage of 80 column screens, assuming the resolution is good, is that the writer can see across the entire page of text. It looks normal. Some programs show forty columns in the writing space, but have a separate miniature page giving the writer some idea of what the page will look like. There are also programs with special character sets which act like 80 column cards and there are programs which allow the writer to scroll beyond the edge of the monitor window see the final part of each sentence. This last option produces a jumpy screen, makes it impossible to proof text quickly and produces erratic behavior in users who have been found trying to climb into the screen to see around the corner.

Delete: the electronic equivalent of crunching paper into a ball and throwing it in the fire. It is gone. Forever. Delete (Erase in some programs) removes the file from the disk and, unless you have another copy, it is gone. Forever.

Directory: a list of the files you have already saved on the data disk. In some systems, this is called a Catalog. Usually, a word processing program will only recognize those files it can actually read. Sometimes, it lists other files which are stored in a similar format, but which really cannot be read. Ignore them. Be sure to label your files so that you be able to find a file easily.

Hardcopy: wonderful word. It means a paper copy. Soft copy means either information to be sent over a telephone line (Modem) or the copy of the file on a disk.

Justified: typed materials are normally left-justified (all the first letters on the left hand margin line up.) Newspapers and books are often also right justified. Word processing programs often offer the option of right justifying the text. It usually looks terrible. The computer takes each line, counts the number of left-over spaces and inserts them between words beginning on the left-hand side. If it gets all the way through the line and still has spaces left, it goes through once more. Some, more sophisticated programs offer "proportional spacing" which add the left-over spaces in as fraction of a space each time. Classy. Center-justified simply means the line is centered, like a title

If you forget to turn off the center justify, you work will be printed out as intriguing, if not good, poetry.

SEARCH: There are usually two forms of the search command. A simple search allows you to find a unique place in the text. A search-and-replace command allows you to locate a word and then change it every time (or only some of the times) it occurs. The possibilities are endless. You can search for the name of your boss, which you mis-spelled throughout the entire report; you can search for every "e" and turn your text into pig latin, or code. You can search for overused phrases or patterns, or you use an abbreviation which you later turn into a longer phrase or formula.

WORD PROCESSING IN THE CLASSROOM

ISSUES FOR THE WRITER

Word Processing has some clear advantages for the author, student or teacher:

a. neat drafts. Editing by writer, teacher or peer is now possible

b. ease of editing. It is easy to make neat changes in the spelling, sequencing or syntax of the text.

c. classy looking copy. The words may not mean anything, but they look nice.

There are also some clear disadvantages for the same writers:

a. pre-requisite typing skills. If you can't find the T or the A, a word processing program will not help you.

b. pre-requisite computer operation skills (loading, saving, using the printer, storing disks). Although you can learn these skills using a word processing program, you are confusing two sets of skills (learning to operate the compter and learning to use a word processing program) that are better learned separately.

c. tendency to slow the momentum of the first draft. Some writers like to use the lulls in their energy to walk around correcting spelling; others have to learn to ignore these distractions and keep writing.

d. potential revision at the trivial level. Editing is a fine art. The author needs skill at both format-level editing and conceptual editing.

e. dependency on availability of the microcomputer. If the writer doesn't have a reasonably quiet place and a reasonable length of time, the microcomputer will not be an effective writing tool.

ISSUES FOR THE SCHOOLS

a. equity of access. Who gets to use the limited number of microcomputers and for what purposes? Word processing is very use-intensive activity. What about the programmers? What about the artists, the musicians, those using drill and practice programs? The school system must set goals and priorities to determine who uses this resource. It

is foolish to teach word processing skills if students are not given access to the microcomputers.

b. health. There is no doubt that microcomputer screens (and especially TV screens) can cause eye strain. There is still some question about the microwave emission from monitors.

c. student skills. Who will teach keyboarding? Who will teach editing? Who will help students use the skills they learned in word processing in their non-electronic writing?

d. teacher skills. Who will help the teachers learn to use the computer and the word processing program correctly? Who will help the teachers incorporate word processing into the present goals and curriculum of the school? Who will help the teachers keep up with the literature on successful classroom uses?

e. support. Who will repair the computers, replace tired disks, schedule computer use, and select improved programs?

The educational questions cannot be decided by one teacher, or by one administrator. Once teachers and administrators know how to use of microcomputers for word processing (and for other purposes), they need to meet to explore these questions throughly and develop both short-term solutions and long-range plans. This process is curriculum development at its best. Given the goals of the school system, the power of the microcomputer as a word processor and the reality of limited resources, how should the microcomputer be used to improve writing skills? For more information on this process, see the HEC manual: Developing a Computer Curriculum.

BANK STREET WRITER

This introductory word processing program is available on a number of brands of microcomputers. The directions that follow are for the use of the program on an Apple II or IIe.

The Bank Street Writer program was designed to be used as a first introduction to word processing. It is a wonderful program. The menu is at the top of the screen, the commands are easy to understand, the shape of the characters on the screen is excellent and the screen is very calm.
Of course, nothing in this world is perfect: Bank Street Writer is slow (moving between the WRITE and EDIT screens can drive the writer crazy), the size of the files is small (about 3 pages although files can be "chained" together; there is no way to use fancy print styles and no way to underline. The tab system is also very poor.

The fact that most people will outgrow Bank Street Writer, does not diminish its value. It is an excellent program to introduce children and adults to the word processing process. It can be used in the Primary Grades just to have students write letters, words or stories on a screen; it can be used in the High School Business Education program to introduce students who will be using business programs to word processing. It is also a good utility word processing program for writers who use computers infrequently and, therefore, don't want to have to learn elaborate commands.

There is a tutorial, which is much less inspired than Banks Street Writer in approach, on the reverse side of the disk. Unlike the word processing program, which can be removed from the disk drive as soon as it is loaded, the tutorial must stay in the disk drive. It is very helpful for writers who need to review commands, or who need keyboarding experience.

The Bank Street Writer program is sold by two companies: Borderbund which offers a cardboard box with 2 disks and a very useful manual (especially for using the Utility Program) and Scholastic Press which offers a 3-ring notebook with 3 disks, a teacher manual and a student manual.

1. GETTING STARTED

Load the BANK STREET WRITER into the computer (label side front and up, disk drive door closed. Turn on the computer and monitor, do not turn off the computer while the red light on

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the disk drive is on.) If the disk seems to whir forever (more than a minute), press RESET (or ctrl/RESET) to stop the process. Open the disk drive door, take out the disk, turn off the machine and start again. If that doesn't work, ask for help.

Take out the program disk and store it safely. If you are planning to save your work, you can put a formatted disk into the disk drive now (see section 3 for more information.)

2. WRITING IN BANK STREET WRITER

You will find yourself looking at a box with some writing at the top. You are in the writing mode with WRITE OR CORRECT in the top left-hand corner. The choices listed for you are

a. type at the cursor (which is a line rather than the usual highlighted box.)

b. erase (using backward and forward arrows)

c. If you have a shift adapter on your Apple II or if you have an Apple IIe, just use the shift key to capitalize. Otherwise use shift/n once for single capital; shift/n/n for shift lock which is disengaged with another shift/n). One of the nicest features of the program is that the screen displays upper and lower case letters whether or not your machine has that feature.

d. Editing mode (ESC) key.

3. EDITING

The editing menu (with the cursor arrow symbols in the top right-hand corner) offers a number of editing options. To select a option from the list, move the lighted box over your choice (using the arrows) and press RETURN. (If you forget, the directions are in the top left-hand corner.)

a. Move the cursor around on the Apple II, use (J,K,I,M) as explained in the diagram; on the Apple IIe use the four arrows. There are also larger moves D (for down the text),U (for up the text), B (for beginning of text) and E (you guessed it.)

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b. Erase blocks of text (small amounts of text are most conveniently erased by placing the cursor before or after the offending characters, pressing ESC to return to the WRITE OR CORRECT mode and using the arrows.) For those of us who panic easily about sending our precious words into electronic heaven, the commands associated with ERASE are wonderfully reassuring.

c. Move blocks of text. Again, the MOVE commands are wonderful, both to reduce panic and to encourage the author to "try it another way."

d. Search and destroy. The REPLACE command is equally easy to use. I find this command helps me keep the forward momentum of my writing. Rather than stopping to check a specific fact, I insert an unlikely "word" (my favorite is ***). When I am ready to check final details, I can locate these places. If you are a consistently bad speller (I always have trouble with the two c's in success), you can use REPLACE to locate all examples of the problem. Or you can search for over-used expressions. (Put a space before and after your word or you will also get every longer word which has those letters embedded within it.)

e. Search. If you simply want to find the place in the text, the FIND command will get you there. This command may not seem very important, and if you have already made a "hard copy" (paper printout) of the text, you can scan it easily, but scanning an electronic screen is exhausting.

f. Return to the WRITE OR CORRECT mode (press ESC).

g. Move on to the print/save options. (TRANSFER MENU)

3. SAVING YOUR WORK (on the TRANSFER MENU)

a. To save your work, you need an initialized disk. Information on how to initalized a disk appears in the DOS MANUAL, or you can used the INIT command on the third menu. This third, TRANSFER, menu has ESC TO MAIN MENU on the top right corner. All the commands have to do with transferring information (either by saving it, retrieving it or printing it.

b. SAVE allows you to save your text. Be sure to have your initialized disk in the disk drive (label up and at the front, disk drive door closed) when you respond to the questions. Select a name which will fit in the space allowed and which

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makes sense to you. I would recommend that you do not use Passwords. However, if your students do use them and then forget them (which is inevitable), you can read the passwords by using the Utility Program described in the commercial manual. Do not turn off the machine or open the door while the disk drive light is on. It is important to remember to save newly edited versions of your work. You can use the same name (in which case the old version will be erased and you will only have the new version) or you can save both versions (differentiate the drafts by using something like REPORT1 AND REPORT2).

c. CLEAR allows you to clear the active memory of the computer so that you can begin a new file. Of course, you must be sure that you have saved your previous work or.....

d. RETRIEVE allows you to call text from your file disk. Load the BANK STREET WRITER program first, put that disk away, put in your disk, go from the writing menu to the editing menu (ESC key) and then to the TRANSFER MENU. The program allows you to check your disk for the proper name (by asking for the catalog).

e. Because the memory size for individual files is relatively short (about three pages of typescript), you should check the amount of memory left to you occasionally (ctrl/S when in the writing menu). If you plan to make changes later (who doesn't) it may not pay to fill up the memory the first time through. If, however, you find later that your corrections exceed the memory limitations, you can always save the text in its present form and then break it into two files. This text is in two files; the second file begins with "3. SAVING....

4. PRINTING YOUR WORK

Make sure the printer is connected, the paper aligned, and the "on line" light, if there is one, on. If you are having any problems with the printer consult the printer manual.

a. There are two print commands. The PRINT DRAFT version does not offer any formatting (margins, running titles) options, but produces a wide-margin, triple-spaced copy of your work for easy editing. (The typescript matches the monitor version, making it very easy to find places in the text when

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you are back at the monitor.) One of the controversies in word processing focuses on how much time writers spend making substantive changes versus how much time they spend on cosmetic (formatting) changes. Encouraging the author to print out a legible first draft for substantive editing (with plenty of space for comments) is one of many indications that the BANK STREET WRITER is designed to help authors (of whatever age) improve their writing.

b. The PRINT FINAL command offers more options for the finished product. The print questions are fairly obvious. Files can be linked together (hence the question about whether or not the paper should be ejected.) Single sheets or continuous-feed paper can be used (pause after each page) and authors can manipulate line spacing if first lines of paragraphs or subheadings find themselves at the bottom of a page (see where page will end.) Margins are set so that the left margin is wider than the right (you select the number of characters of print). If you don't like the ratio of right/left margin, you can change that using the Utility Program (see the manual).

c. It is also possible to center justify headings by using ctrl/C in the writing mode (WRITE OR CORRECT).

BANK STREET WRITER is certainly the easiest word processing program I have ever used. It is ideal for teaching the concept of word processing to anyone. Even those who eventually will use more complex word processing programs can get an overview of the procedure of word processing with this program.

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AN INTRODUCTION TO BASIC

BASIC

BASIC is an interactive language which was designed to help college students who were bogged down learning Fortran understand computer programming more easily. BASIC (which is capitalized because it is an acronym) is available on most microcomputers. Each version is slightly different (of course.) There are dozens of books on the market teaching introductory and advanced BASIC. Be sure to pick one that not only matches your microcomputer, but that takes advantage of the the special graphic, music or formatting capabilities of your machine.

1. GETTING READY

With the Apple II or IIe, you can turn on the computer, press CTRL/RESET (hold down the control key, press the Reset key, release both) and you will find yourself in BASIC. However, this is a slightly dangerous habit since you will not be able to save your work unless you have let the computer know that there is a disk drive attached to the computer. Therefore, put the DOS System Master or an intialized file diskette in the disk drive before you turn the computer on. Remember disks go in with the label right side up and at the front, close the disk drive door, turn on the computer and the monitor. If you cannot find a System Master Disk and don't know what an intialized disk is, just turn on the computer, press CTRL/RESET and don't worry about saving your work later.

2. THE PRINT STATEMENT PROGRAM

There should be a flashing box near the southwest corner of the monitor (TV screen). If you have an Apple IIe, put down the CAP LOCK key; it must be down whenever you work in BASIC. Type

```
NEW (and press the RETURN key)
```

This command erases any leftover programs that might have been loaded in with the disk and gives you a nice clean workspace in the computer to write your program.

Type

```
10 PRINT "THIS IS MY FIRST PROGRAM"
20 END
```

The 10 is a line number. Since you, the programmer, can add lines to your program later, you want to leave lots of empty lines (1 through 9, 11 through 19). Be sure you have used the zero key not the key for the letter O. The zero should have a slash through it. If it does not, simply re-type the line. (The new version will replace the old version.) The command PRINT in line 10 tells the computer to print anything between the two quotation marks. The END is, believe it or not, the end.

Now, test the program by typing

RUN

What happened? Did the words in the quotation marks appear just below the word RUN? It would be nice to have the words look more impressive, type

5 HOME

The command HOME clears the screen and puts the cursor in the northwest corner. To see the sequence of the the program, type

LIST

Why do you clear the screen before having the computer print the words on the screen? Now test the program by typing (close your eyes and see if you can remember the command. Right, type)

RUN

OK, let's change the words inside the quotation marks, type

10 PRINT "......." (put anything you want between the ")

The new line will replace the old line. Test it by typing

RUN

Now make have the computer chase its tail. Add a new line

15 GO TO 10

Type LIST to look at the entire program. First the screen is cleared (line #5), then the words between the quotation marks are printed (line #10), then (in line #15) the computer is told to go back up to the previous line and print the words again, and then... What do you think the screen will look like? Check you hypothesis by typing

RUN

Small problem, the computer will never stop. Don't pull the plug, just hold down CTRL (the control key) and press C to break into the program. (Control key combinations are usually shown with a slash e.g. CTRL/C.)

One more change: type

10 PRINT "yourname ";

The real change in this line is the semicolon after the closing quotation mark. The semicolon is a command to the computer to suppress the "carriage return", i.e. the cursor will not drop

down to the next line. Test your program (you don't need to be told the command anymore.) Stop it the same way you did the last one.

Try different names by retyping line 10. Different combinations of characters produces very different patterns.

Spend some time trying different print statements. You can put symbols between the quotation marks. Take out lines 15 and 20 by typing 15 and pressing RETURN and then 20 and pressing RETURN. If you want a to put a space between two lines of text, you can create a blank line with an "empty" PRINT statement:

```
10 PRINT "GOOD MORNING EVERYONE"
20 PRINT
30 PRINT "THIS IS THE COMPUTER TALKING TO YOU."
```

Try filling the screen with words, with a pattern, with a combination of words and patterns.

3. LOOPS

GOTO statements are great, but sometimes it is nice to easily control how many times something will be repeated. Let's start all over again with a new program. To erase your present program, type

```
NEW
```

Now type

```
10 FOR L=1 TO 21
20 PRINT "LOOPS ARE FUN"
30 NEXT L
40 PRINT "MOST OF THE TIME"
```

Line 10 starts a counting loop with the number 1. Line 20 prints LOOPS ARE FUN on the screen. Line 30 adds 1 to the counting loop (so that the value of L is now 2), checks to see if the value is greater than 21 (which it isn't yet) and sends the program back up to 20 which prints LOOPS ARE FUN. And so on until the 21st printing, then, when line 30 adds 1 to L, making it 22, the program goes on to line 40 (and prints the words inside those quotation marks.)

Try it. You can see that line numbers produce what print statements by typing

```
TRACE
```

and then RUN. The numbers on the right are the line numbers of the program. When you are finished, type NOTRACE.

To check out your understanding another way, change line 20 to:

```
20 PRINT TAB (L) "LOOPS ARE FUN"
```

The TAB command works as it would on a typewriter, except that it always counts from the left side of the screen. Take a pencil and paper and try to anticipate what will happen when this program is run. Remember the value of L increases by one each time. Run the program. Did it work as you anticipated? What will happen if you change line 10 to

```
10 FOR L= 1 TO 10 STEP 2
```

Try it. What does the "step 2" do? What about

```
10 FOR L = 10 TO 1 STEP -2
```

What do you think will happen? Try it?

4. INTERACTIVE PROGRAMS USING INPUT, GET and variables

Whenever you are asked to type in your bank card number, your name or an answer into a keyboard, you are using an interactive program. Now it is time to write one. Type

```
NEW

10 PRINT "WHAT IS YOUR NAME?"
20 INPUT N$
30 PRINT
40 PRINT "WHAT IS YOUR FAVORITE NUMBER?"
50 INPUT N
60 PRINT
70 PRINT
80 PRINT "HELLO, ";N$
90 PRINT
100 PRINT "DID YOU KNOW THAT YOUR NUMBER MULTIPLIED BY"
110 PRINT "ITSELF IS ";N*N
```

Check off the statements you understand already. You know what 10 does. You know all the blank line commands (30, 60 etc.) Line 20 uses the command INPUT which tells the computer to wait for the program user. The user is going to type in something that should be stored as a series of letters under the variable name N$ (read as "N string"). In Line 50 the computer is told to wait for the user to type in a number and to store it as N. In Line 80 the computer prints the word HELLO and then the name the user has typed in. In line 110, the computer prints ITSELF IS and then the number the user has typed in multiplied by itself. Run the program. When you run it, you have changed hats and become the user who must type in the name and number. Run it again with a different name and number. And again. Using the pattern of this program, write another interactive program.

5. GRAPHICS

The graphic screen is like a piece of graph paper with 0,0 in the northwest corner. The Apple has both low resolution graphics which produces brick-like blocks on the screen and high resolution graphics which produces thinner lines, but is slower and has fewer colors. We are only going to look at low resolution graphics. There are 40 points (boxes) across the screen and 40 down.

```
NEW
10 GR
20 COLOR = 12
30 PLOT 5,10
40 HLIN 0,39 AT 20
50 VLIN 0,39 AT 20
```

The GR sets the computer to the graphics screen. The color value must be set, otherwise it will be set to 0 which is black and therefore will draw a black brick on a black screen... Not too interesting. The color numbers are 0 to 15. The PLOT command puts a brick 5 in from the left edge and 10 down from the top. HLIN draws a horizontal line from 0 at the left side to 39 at the right side on the 20th row from the top. The VLIN draws a vertical line from 0 at the top of the screen to 39 at the bottom on the 20th column from the left hand side of the screen. Using pencil and paper, draw what you think you will see when you run the program. Now run the program. Were you right? Try other colors and lines. Can you draw your initials? When you are trying to change the program, you will find yourself limited by the graphics screen. Type TEXT before editing your work. If you can't stand all that garbage on the screen, type HOME.

6. HOUSEKEEPING

SAVING

Assuming you have turned on the Apple with a disk in the disk drive, you can now save your work. To save a program you have written, put in initialized disk in the disk drive (label at the front and facing up), close the disk drive door and type

SAVE GEORGE (or whatever you want to name your program)

If you want to see if the system worked, type

CATALOG

Your program should be listed on the disk as A 002 GEORGE. The A stands for Applesoft (Apple's word for BASIC), the three digits for the number of sectors (sets of 256 units called bytes) used to store you program and the GEORGE is the program name. If you have a long program you will use more sectors (obviously).

LOADING

To use a program you have already saved, put the disk with the program in the disk drive. Make sure you have the right disk by asking for a catalog. Type

```
CATALOG
```

Then type

```
RUN GEORGE
```

PRINTING

To get a printed copy of your program commands, turn on the printer, make sure the paper is feeding properly and that the "on line" light, if there is one, is on. Type

```
PR#1
```

(This will send the next commands to the peripheral connected to the computer in slot #1, which is the printer.)

```
LIST
```

This will produce a printed copy of the program for you. If you also want a printed copy of whatever goes on the screen during the running of the program, type

```
RUN
```

If the program is interactive (uses INPUT statements) you will have to type in the words as the user.

To turn off the printer, type

```
PR#0
```

7. MORE

There are many books on BASIC. Learning some programming will help you understand the programs you use and will help you understand more of the terminology you find in the manuals. The real reason to learn BASIC, however, is that it is fun.

ELECTRONIC SPREADSHEETS

THE ELECTRONIC SPREADSHEET

There are a number of different versions of this type of software. The first one, and the one this lesson will use is VISICALC.

There are really three aspects to the purpose (and value) of these programs.

1. Calculations. Any box in the matrix (or table) can be related by formula to any other box. For example box C4 can be the sum of the numbers in boxes C1, C2 and C3. Once you set up a worksheet with values (numbers) and formulas, you can change numbers, or enter new numbers and have all the subsequent calculations done automatically. As is true of all similar software, you can save your table (both the actual numbers and the formulas) so that you can recall it for later use.

2. Simulations. Because of the rapid calculating ability of the computer, and the relationships between numbers you can establish when you set up a table, these programs allow you to ask "what if?". In other words, you can simulate different conditions: inflation at different rates, pollution at different parts per million, election results if one state had voted differently, whatever. This is the real power of these programs both for administrative and instructional purposes. It is, therefore, very important that the original relationships, which are reflected in the formulas, are carefully thought out (although they too can be changed during a simulation).

3. Presentations. The rapid recalculation of data invites you to have the microcomputer with you during a committee or class discussion of the data. New figures can be entered, results are available instantly. The worksheet can also be printed as a table for reports, or can be transferred to a program which plots graphs (like VISIPLOT). As you know, graphic presentations of data are often more effective than a written report.

As with most elegant ideas, the concept of the electronic worksheet is so simple it is easy to dismiss its value. The best way to understand the power of the electronic spreadsheet is to use it for a project of your own. The directions here apply to VISICALC, but the sequence could be used to apply to any of the similiar packages on the market.

1. GETTING STARTED

Load VISICALC into your Apple II.

REMINDER to those who don't regularly use a computer. The disk goes in the drive with the label up and to the front, close the disk drive door, turn on the computer (back left) and the monitor, wait for the whirring of the disk drive to stop before doing anything. If nothing is happening either to the computer or the monitor, check that each is plugged in to a grounded socket and that they are plugged into each other.

If the whirring goes on for more than a minute, press the CTRL key and the RESET key simultaneously. When the whirring stops, open the disk drive door, check that you have the right disk in the right way. Repeat all steps. If it still doesn't work go for help (tea is very soothing).

2. TRAINING MODULE

There is an excellent training module built into most of these programs. Check the manual to find the directions, run the modules and learn the capabilities of the system. (I am basing this lesson on the assumption that nobody will follow this step; life is like that.)

3. ENTERING INFORMATION

If you have loaded VISICALC into the computer, you should be looking at a screen with stuff at the top and down the left hand side. Press the RETURN key to get rid of the copyright information. In order to put some labels and numbers into this lovely matrix you need the following basic information.

a. The white rectangle is the cursor, it tells you where you are about to write. To move the cursor check the C in the top right corner.

If it says C! the cursor can be moved up and down a column with the left and right arrow.

If it says C- the cursor can be moved right and left along the rows with the same right/left arrows.

To change the directions (up,down/right,left) press the space bar.

Try moving the cursor around for a while. The REPT (repeat) key can be used in combination with the arrows to speed up the

action. If you want to move faster (say from A1 to G25) you can type >G25 (press RETURN) and zap, it's there.

b. Entering information. Whatever you type in a box is not officially entered into the computer until you either (1) press RETURN or (2) move the cursor to another box.

c. Labels. Any box can be a label. All you do is type something beginning with a letter. If you label happens to be something like 100-2035, which doesn't begin with a letter, type " before the 1. If you forget the ", the computer will assume you meant to subtract 2035 from 100 and will put the result in the box (not helpful if 100-2035 is a line number in a budget.)

d. Value. The alternative to LABEL is VALUE. The value can be a number or a formula. Almost all standard mathematical conventions apply (check the reference card or manual for more details.) Sometimes a formula begins with a variable. For example the sum calculated earlier would be C1+C2+C3. Since the first entry in the formula is a letter, the computer will assume you are beginning a label (which you are not). Therefore, begin the formula with a plus sign, i.e.+C1+C2+C3. If you are working with large numbers, you may be tempted to type in the comma (1,245). Don't. The computer has no idea what to do with the comma and will type out error statements.

e. Errors. Before you actually enter the information you have written in a box (by pressing RETURN or by moving the cursor to another box), you can erase by backing over your work with the ESC key. After you have entered your work, you can change it by:

(1) typing /E will put you in the edit mode, using the arrows to move around and the ESC key to make changes, correct. When you are finished, press RETURN

(2) typing /B and RETURN will blank out the box.

(3) placing the cursor on the offending box, typing in something new and entering it by pressing RETURN or moving the cursor to a new box will change the box from the old information to the new information. (This is really too easy to do; it is very easy to change boxes by mistake when you aren't paying quite enough attention.)

4. SEEING YOUR WORK

The elegancies of life. VISICALC has a number of commands which make playing with numbers almost fun.

a. Titles. As you realize, you will soon scroll the screen toward the southeast so that you can no longer read the titles and, therefore, can't remember what the numbers mean. You can freeze any row or column of titles on the side of the screen by placing the cursor on the titles you want and then typing /T. You have the choices of H (horizontal titles), V (vertical titles), B (both h and v), N (none, cancel the freeze.) (Any command beginning with / tells the computer that a command (not a label or number) is about to come.)

b. Split screen, if your totals are off at the bottom or side somewhere and you want to see what effect the changes you are making have, you can split the screen to see both parts at once. Place the cursor at what you want as the edge of one of the screens and type /WH (for a horizontal window split) or /WV (guess what that stands for.) To move the cursor between the two windows, press ;

Windows will scroll together (synchronized) with /WS or will be unsynchronized /WU. To return to one window, /W!.

c. Adding and deleting columns and rows. If you have forgotten to put in something, you can add a column or row by /I (insert), then either R or C. You can also delete by /D, then either R or C.

d. Sometimes you will need to do some calculations before you enter a value, but you don't want those calculations to be saved as part of the program. Just type out whatever formula you need and, instead of pressing Return or moving the cursor press !. The results of your calculations will appear in the bar at the top. To enter that value in the box where the cursor is, press Return. (Remember to use the computer as a calculator when you need one; it is bulkier than a pocket calculator, but if you are sitting at it anyway...)

e. People often set up an elaborate formula for one box which is similar to what they want for another box. For example, Column C4 is +C1+C2+C3. (Remember why that first plus is there? If you don't, re-read the section on VALUES.) Imagine for a minute that D4 is going to be the sum of D1,D2 and D3. There is a way:

Place the cursor over the formula you want copied (in this case on C4) and press /R which allows you to replicate the formula.

The prompt line will show C4, press RETURN and it will show C4..C4, now move the cursor to D4 and, if you only want the formula for D4, press RETURN. If you want the formula in E4 and F4, press the . (the cursor will jump back to C4, move it to F4, then press

RETURN. The prompt line will now have C4...C4:D4...F4 and the cursor prompt box will be on C1. Since you want that to read D1 (for the D sum) and E1 and F1, press R meaning you want a "relative change" (the alternative is N for no change, i.e. a situation in which you always want C1 in the formula), go through pressing R each time. (Don't get carried away by pressing to many Rs or you will find yourself having written a label reading RRR.)

Since this calculation takes the computer a long time (15 seconds at least!) be patient until the cursor comes back on the screen. It will take a bit of work to become comfortable with the Replicate funcion, but it is one of the most powerful editing tools in VISICALC.

By the way, here are some other tricks with /R:

To get a line of dashes across the page (to separate types of data), put ----- in one box, then replicate across.

To have the same formula (with relative values) used both down and across, put the cursor on the model formula (say C4) type . and the bottom left box (say C10) then the first box to the right (D4), then ., then the last box to the right (M4), and answer the appropriate R (relative) N (keep the same) questions. The entire box C4-M4,C1-M10 will be filled in.

Save time writing formulas for sum, count, average, maximum or minimum. Type @SUM and give the first and last boxes in the series. These functions all begin with @. Another advantage of the @SUM, or similar commands, is that inserted columns are included in the calculations. For example, if you had the formula +C1+C2+C3 and inserted a new C3, VISICALC would change the formula to +C1+C2+C4. If you had put @SUM(C1...c3), VISICALC would change it to include the new row as @SUM(C1...C4).

To set a format (right justified, left justified, two decimal points ($), integer) for a row or column, IF the BOXES are EMPTY, press /F and your choice for the first box, then replicate down the row or column. (If you want the same format throughout the sheet, use /G (global) F (format).

To copy a single value or label in a different space. Go to the new space, type the old coordinate (say A7) and then # (i.e. A7#) and RETURN. The value of A7 will be put in the new box.

5. STORING FILES

It is, of course, possible to save your work.

a. If you have not already initialized a disk, follow the directions in this section. Remember, once a disk is initialized (i.e. electronically set up to be read by your machine, you will NOT need to do this again.) If you need an initialized disk: take a clean disk. With VISICALC loaded into the computer, put the disk in the drive (label up and at the front, close the door). Type /S and then I, since you will ERASE EVERYTHING ON THE DISK, you are asked to confirm your command. The disk will grind and whir. When there is no sound and no light on the disk drive, the disk is ready to use. Be sure to label it (felt tip pen so that you don't destroy data with a hard pen or pencil point).

b. When you are working on VISICALC, you should save your work regularly. (Most people don't believe that until they loose three hours work to a power failure, helpful child, or entry error. After that, they are converted.) To save type /S (for storage commands) then S (for save) and then give your file a title. The wise make a second, back-up copy on another diskette which is stored separately. If that seems like an expensive luxury, compare the value of your time to a $4 diskette.

c. Other ways of saving VISICALC. There are additional commands to save your data (1) in text file format (so that it can be used in some word processing programs and in BASIC) (/P F) and (2) in such a way that it can be accessed by the other VISI... programs (/S # for data interchange format or DIF). For more information, consult the VISICALC manual.

6. RETRIEVING FILES

If you can store, you must be able to retrieve. If you have just loaded VISICALC, you have nothing to erase before you begin. If you have been working on one table and now want to work on a different table AND HAVE ALREADY SAVED YOUR WORK, type /C to cancel what is on the screen. (If you don't do that you will load two spreadsheets on top of each other, what a mess.)

Put your storage disk into the disk drive (label front and up, door closed.) Now type /S (for storage commands), and L (for load). If you remember the title of the file, type it in. Otherwise, use the right arrow to read the titles on your disk. When you get to the right one, press RETURN.

(If you hit the RETURN too soon, or forget the title and find yourself with the wrong table, go through the clear and load process again.)

7. PRINTING

And of course, you can print out your work.

a. Formatting decisions. The electronic worksheet is much larger than the paper available to you. You will need to play around to decide what looks good on paper. The choices available to you include which set of columns and rows, how wide the columns should be, and whether the numbers should be right justified (and decimal places truncated.) /G (global commands apply to the entire sheet and C (columnwidth) will set, you guessed it, column width. /F sets the format of entries with $ for dollars and cents, /R for right justified.

b. The only way to get the printing right is to try it different ways to see how it looks. Check that the printer is hooked up, the ON LINE light (if there is one) on, paper feeding properly etc.

c. Place the cursor in the box you want as the upper left corner. (If the cursor beeps, refusing to go into the labels, that is because you earlier froze the labels in place. Type /T and N to unfreeze.

d. Type /P, when asked about printer slot press RETURN unless your printer is not in slot #1 (if it is not, type in the slot number). Type in the location of the bottom left hand edge of the table you want printed (or move the cursor to the bottom right corner) and press RETURN.

e. You may find that you have printed out too many columns. The printer will put it all out, but will continue the last part of line underneath the first part, producing a totally unreadable mess. You may need to print your information out on a number of pages. Or you may want to locate a printer that will use wider paper or one that will type in compressed print.

f. If you have an EPSON printer, you can print your table out in compressed mode (small), by following these directions. (There are surely similar directions will all other dot matrix printers, check your printer manual.)

VISICALC to EPSON

(1) put the cursor on the top left-hand corner of the area you want printed.

(2) type /P when asked for slot #, if yours is in #1, press RETURN. If it is elsewhere, type in the slot number of your printer interface card.

(3) when asked for bottom lower setting type:
" ^ C O (return)

(4) you will be asked the same question again, type:

- then put the cursor in the bottom right box (or just type in that box number) and press Return.

The table will be printed out in compressed mode. You have now set the printer to compressed mode. If you want more tables printed out the same way, follow the standard print directions (i.e. skip #3 and the - in #4), if you want to return to normal print, turn the printer off and then on again. If you want to use other print modes (italics, emphasized etc. save you visicalc program, leave VISICALC, set the printer using commands in the Epson Manual, reload VISICALC and your data (be sure not to turn the printer off once it is set or it will return to Normal Print.)

8. GETTING HELP

Which brings us to the last portion of this lesson. This handout is not designed to replace the manual provided with VISICALC. Spend some time touring the manual so that you will know how to look up information when you need it. Copy, laminate, post, or tatoo on your arm the 10-page Reference Card and the chart after page 3-2. Ask. There are lots of people using VISICALC or any other electronic worksheet. If the salesman doesn't know the answer, a colleague will; if she doesn't, call the company. They all have 800 numbers for customer relations.

There are also a number of books about VISICALC on the market. My favorite one is by Beil. Most of these provide formulas aready worked out for setting up worksheets for business uses. You will certainly want to look through these to find if any are helpful to you. Check at stores selling computers and at bookstores with computer, business, or business school clients.

9. GRAPHIC PRESENTATIONS

This is the very last portion. The information you have entered in VISICALC can be used in other compatible software packages (usually referred to as visiclones or calcalites, cute). You will need to save your file in a slightly different format (check the manual of the other program you want to use for directions). At least try some graphing of your data. Great fun, and a much more effective presentation than one more page of rows and columns. (With VISICALC, you would use VISIPLOT which is a very easy program.)

Oh, one final word. You can leave VISICALC (assuming you have saved your work) by typing /S (storage) and Q. If you want to work on a different program, put that disk in the disk drive and type 6 when asked for slot number (your disk drive is attached to the computer by an interface card in slot number 6).

DATABASE MANAGEMENT

WHAT IS A DATABASE?

A database is really nothing more than a computerized filing system. It has a FILE (for example: Personnel) which is made up of individual RECORDS (each employee). Each record has a number of entries, or FIELDS, (first name, last name, address, social security number, etc.). The file user(s) can sort the information in a variety of ways for a variety of purposes (alphabetic list of personnel, print-out for W-2 forms, paycheck, telephone listing of employees by department,etc.)

All of us have had personal experiences with databases. In fact, each one of us is a member of many different databases: at the bank, at the doctor's office, at the Registry of Motor Vehicles, at the IRS, at the office of every cause, good and bad, which wants our assistance. Sometimes we feel like Picassoesque figures with each plane, each geometric shape, a database. One of the many books on business applications of databases calls data a business resource on par with capital and labor. How does it feel to walk around being national resource?

The simplest form of a database is probably a mailing list. You might be responsible for keeping track of the current addresses for 100 people. If the only changes you ever need to make in that list is the updating of addresses, a card file is the perfect database. However, you might want to send letters to all 100 people. If such mailings occur only occasionally, hand written envelopes are fine, or you could type labels onto label masters which are then photocopied.

Problems arise when you need the list alphabetized by last name for one purpose, sorted by zipcode for mailing AND someone wants a list of only those people who fall into some specific category: three lists, with more to come. If you had that address list, along with a few discriptors for each person, on a computerized database, t you could produce each list as required. (You could also update the addresses, which was your original goal.) Easier said than done - but not impossible.

The first step in developing a computerized database is to decide what information you want about each person: first name, last name, street address, town, state, zip, phone and those

descriptors (membership renewal date, job title, sales contact, contract number and value, whatever). When you need a list for renewal notices you search for those with next month's date and print out a mailing list (using only name through zipcode in the print-out). When someone wants a list sorted by contract amount, zap.

ORGANIZING A USEFUL DATABASE

Selecting the appropriate database system (software or program) and designing the categories you plan to use for the database are so intertwined that it is difficult to decide which to discuss first. However, both hardware (the computers) and software (the programs) are changing so fast, that you might as well begin assuming that when you are ready to select a database one will be available that will meet your needs. So we will start with looking at what you need to do before you turn on the computer.

Entering information into a database is time consuming, very time consuming. Therefore, you want to start with as much careful planning as possible. There are (at least) two dangers. On the frying pan side, you may unnecessarily limit the size and purpose of your database so that you will end up having to have 3 databases to do the job that should be done by one. The fire, of course, is that you will design such a huge database that you will run out of storage space on the microcomputer and it will take all day to sort the files. You need a database that will be flexible enough to meet your changing needs and small enough to be manageable.

Unless you work entirely alone, you also need a database that meets the needs of others with whom, and for whom, you work.

Great, more meetings. You will probably get more information from people if you go to them with a rough plan, get their ideas, come back with a fairly complete draft and get their ideas again. Given the perversity of human nature, their best ideas will come one week after the data is all entered, when at least three people will have brilliant ideas that really would have been useful 3 months earlier. If fact, of course, until we see something actually working, most of us have difficulty thinking of how an innovation can help us. Therefore, you might want to think about taking on a small project for your first database so that you, and your colleagues, can learn from the experience.

Don't get discouraged when the reactions to your first demonstration are comments on typographical errors, the small

size of the database, the incredible amount of time it took to enter the data compared with using the already excellent filing system, and a totally different approach that would have worked much better. Write all those ideas down for the next design. Some of them may actually be helpful. A month from now your loudest detractor will come to you with the most exciting, innovative idea: what about taking all the information we use for .... (you fill in the blank) and putting it on the computer! Keep smiling, you have just achieved "ownership of the innovation by the user."

If you are fortunate enough to be able to turn over the entry of data to others, be sure that they keep a log of problems and suggestions as they do the data entry work. If the program you are using makes it difficult to enter information into the database (either because the directions are ambiguous, corrections time consuming, or data easily destroyed), that program is a failure. Only those who have spent hours entering data which was then stored on top of previous data, or lost completely, or lost randomly realize how important it is to have a good, entry-friendly program.

A good database should:

1. Meet immediate needs.
2. Encourage users to think of additional uses.
3. Make it easy to enter, correct and update information.
4. Work easily within the limitations of the available computer. (More about that later.)

Caution: If you only have to update information, not sort it in different ways, you probably need a word processing program, not a database.

Second Caution: If you only have temporary or intermittent use of a microcomputer, play with the computer, try building a few bogus databases, but don't try any serious work. A computerized database which is updated, accurate and accessible is a wonderful tool. A database which you can't use whenever you need it is total waste of time (unless you are a psychologist interested in studying stress.)

To summarize

1. Define what you want to do: what problem do you have that a computerized database system would help you solve?

2. Analyze the requirements of the system: what does it need to be able to do for you and for others?

3. Design a system: what would it look like if you were going to store the information on cards, manually sort them and compile the information into a report?

4. Try it out with a database program : put in a small amount of useable data so that the test is real, but the work of entry has not be backbreaking.

5. Review and evaluate: ask everyone involved with entry and use what changes should be made? Are there 4 databases where there should be one? How many people (bookkeeper, quarterly report producer, client contact person, need similar information? How many people have similar mailing lists?

6. Document: make sure that those entering data, and those using it know exactly how to do it. If they get frustrated by poor training all that work will have been wasted. There must be a home somewhere with big shady trees for unused databases.

7. Supervise: someone must be responsible for regular (every Thursday morning from 10 to 11) updating of the files. Users must be responsible for keeping a log of use and problems, but should not be asked (or allowed) to make changes. A little imagination should help you see why you don't want someone who thinks the client has moved changing the address! Finally, someone must be responsible for weekly reviews of entry and user logs and monthly reviews of the system. (And have the authority, or the access to the authority, to make changes.)

HARDWARE/SOFTWARE ISSUES

Every microcomputer with a reasonable sized memory (48K or better) has at least one database system for sale. Five years ago we began our experience in databases by having programmers write programs specific to our needs. No more. There are too many good databases on the market. They may be expensive, but paying programmers by the hour is, I assure you, more expensive.

Most of my experience has been with Apple IIs. However, there are many other microcomputers with excellent programs. If you do not already own a microcomputer and need to select both the computer (hardware) and the program (software), or if you are only selecting the program, then consider using all of these sources before you make your decisions:

1. computer magazines (reviews, advertisements)
2. computer shows/conferences (workshops, displays)
3. local computer club (find out who is doing what)
4. local computer stores (try them)
5. organizations, businesses near you that use microcomputers in their work (talk to managers, users, observe)
6. workshops or courses offered through extension, community colleges or adult education centers.
7. bookshops (treat them as libraries to look through the latest books on computer uses); libraries (look only at books published in the past 2 years, others will be out-of-date, incredible isn't it?)

Service: Computers break down. The only way to anticipate this is to believe in Murphy's Law. When you are talking to computer stores and to other users be sure to check on both stated service and actual practice. Most service contracts are 10% of the value. You may be able to save money by paying for service as you go, but put aside the money; don't spend it on software. You will always need service. You will need more in the second year, etc. The microcomputer may not have moveable parts, but the disk drive does and it breaks with depressing regularity. (We probably have a higher repair need than most groups because we train so many new computer users on our nine Apple IIs. With the best care we can provide (no smoking or food, as little dust as we can manage) we have to repair an average of one disk drive a week (average cost $35.)

ALTERNATIVES: LARGER MACHINES, SHARING DATABASES

Keep in mind that you may be asking the microcomputer to do more than it can do. If you find yourself talking about networking four computers, adding extra memory and mag wheels, maybe you really need a minicomputer or a terminal attached to a mainframe (the big guys). Maybe there are three or four other groups out there with the same needs and you could share one system.

Caution: Don't get caught in the game of thinking that you can put your database up on any computer, micro or mini or mainframe, to which you do not have immediate and continuous access. Schools sometimes think that they can let the students use the computers during the day and that the office can use them "some other time." No way. If you are asked to produce information on the educational plan for a specific student for a 10 AM meeting, you need access to the computer now, not after working hours. The better your database, the more you will be using it, the more important it is to have the information readily available. Either the microcomputer itself, or a terminal to a larger computer, should be comfortably available to whoever is responsible for using it all day long.

Second Caution: Before you design a database, make sure it doesn't already exist. In a recent national magazine, a business executive explained how he used his microcomputer to catalog his National Geographic collection. National Geographic publishes an excellent index! Check with those who will be using the database with you to see if another exists. Before you even consider putting any reference materials, abstracts, etc. on the computer, consider joining one of the databanks (multiple database systems) available.

FILES, RECORDS AND FIELDS

Let's look at an example of a database containing a single File (in this case a mailing list). The file has RECORDS (one for each person). Each record has a number of categories (or FIELDS.) These field might be:

First Name:

Last Name:

Street:

Town:

State:

Zipcode:

Telephone:

Renewal date:

Salesperson:

Contract #:

Comments:

Last name is usually a separate field so that you can alphabetize. Most databases with which I am familiar allow you to select and print only those fields you need for a specific purpose. (You don't want the Comments printed on a mailing label!)

Whenever it is possible, it is nice to save storage (memory) space in the computer by coding entries. In the list above, the salespeople could be coded, so that you could use 2 or three digits or characters instead of the 10-15 spaces for a last name.

WHAT COMPUTER SKILLS DO I NEED?

Many instructors (and all computer salespeople) will tell you that two hours of training and a few toll free phone calls will be all you need. Not true. If you have never used a computer before, a database is as good a place to start as any, but you can't stop there. You need to understand the jargon (if you don't believe me flip through a few manuals); you need to know what is happening; you need to make wise decisions about alterative uses of the computer.

I recommend that you learn, at the introductory level, some language. We usually start people on LOGO because we love it for it's problem-solving, interactive approach. You will need to know something about BASIC because the BASIC commands are the jargon of the manuals. Many people find learning some PASCAL to be very helpful. Whatever you pick, you don't need to plan to be a programmer, but you should be able to write a simple, successful program. (Using the car analogy, you don't need to be a mechanic to be a good driver. However, you do need to understand the basic functioning of the internal combustion engine, to be able to identify the major parts of the car and to be able to distinguish the difference in the sounds of serious and trivial problems.)

USING A DATABASE IN THE CLASSROOM

There are a variety of ways to use databases in the classroom. The developers of Notebook, a database described later in the manual, tell about an elementary teacher who developed a memo format for students to write messages to each other and to her,

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Almost all social studies and science courses encourage the development and manipulation of data. You can spend hours designing and entering databases for your students, or you can turn that job over to them. Not because you are lazy, but because you realize that the real learning comes in that designing and entering process. If you are interested in (a) encouraging problem solving skills and (b) the active use of the computer as a tool of the problem solver (which, of course, is what it is), try letting students (whole class, small groups, or individuals) develop databases themselves.

pfs (The Personal Filing System)

pfs File and pfs Report

This database is available for a number of computers. The description here applies to using pfs on an Apple II. There are two versions of pfs File for the Apple II (and another for the IIe) wandering around. This manual will describe both of the versions for the Apple II. The main differences in the IIe version is use of directional arrows for moving the cursor on the screen; use of lower case characters, and a bug-free version of re-designing the file.

Requirements: If you had two disk drives, copying files will be easier. In fact you MUST have two disk drives to copy the structure of a file. You must also have two disk drives if you want to sort your data. Since it is difficult to imagine using a database in which sorting is not essential, if you do not have two disk drives you may want to use a different database. There are additional pfs programs which enhance the capabilities of the original programs: Graph (II and IIe versions are different) and Write (available on Apple only for the IIe.) They will not be described here. Although you don't need a printer to understand the purpose of the program, you probably cannot take full advantage of the power of any database if you don't have a printer.

Getting started: Load the pfs File disk into the Apple.

a. Put the disk in the disk drive label-side up and in front, if you have two disk drives, put the disk in the drive labeled "#1."

b. Close the disk drive door.

c. Turn on the computer; turn on the monitor. There will be some scraping noises, DO NOT OPEN the disk drive door until the lisht goes out and writing appears on the screen.

d. If nothing is happening, check all electrical connections. Go through the procedure again. If nothing happens, go for help.

Put the pfs File DISK AWAY. (You won't need it during the use of the program and putting it away protects it from damage.)

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You should be facing a screen which looks like this:

```
.....................................................................
                        PFS FUNCTION MENU

   1  CREATE FILE                      4  SEARCH

   2  ADD FORM                         5  PRINT

   3  COPY FILE                        6  REMOVE

         SELECTION NUMBER:

         FILE NAME:
.....................................................................
```

Whenever you want to get back to this screen, press ESC

To move between selection number and file name use the right hand arrow -->

To erase, use the left hand arrow, then type over or eliminate with the space bar <--

After you have made your choices, press CTRL/C to continue

1. CREATE FILE

From the main menu, type "1", press the right hand arrow. BEFORE YOU TYPE IN THE NAME, PUT A NEW DISK IN DRIVE #1. (Any previous pfs information will be removed from this disk, so be careful which disk you use. See hints at the end of the pfs File section for ways of labeling your disk.) NOW invent a file name that you can remember (no more than 8 characters) and type it in.

You will be given a chance to undo your command. Assuming you want to go ahead, press CTRL/C.

You are now facing a screen with status line at the bottom saying:

```
FILE (YOUR FILE NAME)        DESIGN                    PAGE 1
```

You are ready to create a format for your file.

Each ITEM (called a FIELD in some other databases) needs a name; each name must be followed by a colon. Names can be put any place on the screen. In deciding how much space to leave for each item, you need to know that the field needs to be two spaces longer than the longest entry (for sorting purposes later). Even if you are not going to sort on a certain field, leave at least

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one extra space to make entering the data easier. If you are worried about leaving too much space and filling the disk's memory with blanks, pfs shortens trailing spaces to 3 spaces (3 bytes).

If you should forget to end an item with a colon, when you save your design you will find that item will be merged by a long "light box" to the next item. If, after you finish you design, if you find such a long light box, you have forgotten a colon. Redo your design.

When planning the sequence of your items, it is important to realize that pfs is designed to sort fastest on the first item. Therefore, select the most likely item to be used in a search and place that item in the upper left-hand corner. You can have more than one item on a line. For simple printing of information from forms, lines can be skipped, but the sequence cannot be changed. (So if you want to print mailing labels, put the information in the order it would appear on a label.)

Size limitation: 50 items per screen (or page)
32 pages per form
1000 forms per file (although, the longer the form, the less forms will fit. To calculate the exact amount see Appendix C in the pfs manual)
1 file per disk

When designing a file (or when adding a form), you have the following editing keys available to you:

CTRL/T moves the cursor up a line
CTRL/V moves the cursor down a line
CTRL/G moves the cursor one character to the right
CTRL/F moves the cursor one character to the left

(notice that these four keys form a directional cross on the keyboard)

CTRL/N moves the cursor to the next page of the same form
CTRL/P moves the cursor to the previous page of the same form

<-- moves the cursor back to erase, type over or use the space bar to erase

CTRL/E erases the page (everything on the screen)

ESC returns to the main menu, work WILL NOT BE SAVED
CTRL/C SAVES DESIGN, returns to main menu

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Designing a form that will really meet your needs is time consuming. You should anticipate trying at least 3 versions before you find one that best meets your needs. Therefore, start with a fairly simple format in order to test the capability of the program. For testing purposes, put in about 6 fields. Even if some of the items are forced, include the following types of items:

a code number (like personel number or inventory number or social security number

a real number: price, value, a measurement, something that makes sense to add, multiply or average.

a date: using the format ##/##/## using the order: year/month/date)

a name: of the product, person, or book

a text section which is used for description (this will be a little difficult to do if you are creating a database for an inventory, try to put in 2 lines of text to understand what can be done with it)

put at least one item on the second page (use CTRL/N o get there and CTRL/P to get back) so that you can test the use of a multi-page form.

If you put numbers in with a dollar sign, or commas, pfs will ignore these when doing calculations. If pfs finds periods in a number it will take the first period as a decimal point and ignore the others (11.22.33=11.2233 for calculating purposes.) Minus signs at the begining or end of a number are treated as minus signs, others are ignored (11-22-33=112233 for calculations.) Even if pfs is forgiving about commas and dollar signs, it is good practice to plan to be consistent. If you are going to use a date, sorting will be much easier if you use the 83/10/21 format where the year is first. For this first trial, don't spend too much time, just put in a variety of types of items so you can teach yourself the power of pfs.

When you have enough fields entered to test the program, press CTRL/C. Your design has now been entered on the disk.
On the newer version of pfs there is a way to change the design of the file if you want to. Unfortunately it seems to have a bug in the command which keeps it from turning off properly. If you use this command check the "Helpful Hints #2" section at the end of the pfs file section to stop the processing. The Apple IIe version has solved this problem.

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2. ADD FORM

From the main menu, select #2, give the name of the file you have designed, press CTRL/C. You are now ready to put information in your file. MAKE SURE THAT YOUR FILE DISK IS IN THE DISK DRIVE and that the door to the drive is closed.

The template (empty form) should be on the screen, if it is not, re-read the directions. Assuming the template is on the screen, enter you first FORM (called a RECORD in some other databases.) You have the same cursor movement commands that were available in DESIGN (the T,F,V,G cross; the left-hand arrow; the CTRL/N and P to move between pages.) You also have the right hand arrow --> to move easily from item to item.

When you finish a form, press CTRL/C so that it will be saved and a fresh template will be available for you. Enter about 5 records so that you will be able to test the power of pfs. For testing purposes, enter two forms that have the same name, but some differences in other items. To return to the main menu, complete your final form, press CTRL/C and then, when a new blank form is on the screen, press ESC. If you press ESC while you are entering, the form you are working on WILL NOT BE SAVED.

You can always add more forms. Stop after a five to try out the other commands and to see if your design really does what you want it to do.

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3. COPY FILE

Everytning you will ever read about using a microcomputer mentions the importance of back-up copies. If you don't make backup copies you are asking for disaster. (Or you don't value your own time.)

If you have a double disk drive:

As was mentioned earlier, there are two Apple II versions of pfs on the market, the copying directions are dramatically different.

1. Select #3 and follow the directions on the screen EXACTLY. Back-up disks are traditionally named the same first 6 letters followed by "bk" for backup.

2. When you have completed the entire process, remove the new disk, label it (with a felt tipped pen) and store in a non-magnetic, clean place that is separate from the working copy.

8. Repeat this procedure (either rotating two copy disks, or using the same one) EVERY TIME YOU ADD OR MAKE CHANGES IN THE INFORMATION IN THE FILE.

If you have one disk drive.

1. Leave pfs by turning off the computer.

2. Put the DOS System master in the disk drive, turn the computer back on.

3. Type RUN COPYA

4. You will be asked the following information

ORIGINAL SLOT	6	(press RETURN)
ORIGINAL DRIVE	1	(press RETURN)
DESTINATION SLOT	6	(press RETURN)
DESTINATION DRIVE	2	(type 1)

5. Put the pfs file disk (the one you have your data on) in the drive, close the door. press RETURN

6. When asked to put the DESTINATION DISK in, take out the file disk, put it to the right of the computer, put the new (or to-be-recycled) disk in the drive. As you continue to follow the directions, keep the original on the right and the new on the left (or you may become hopelessley confused.)

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7. Take out the copied disk, label it (with a felt tip pen) and store in a clean, non-magnetic, separate place.

8. Make a new copy (either rotating two copy disks, or using the same one) EVERY TIME YOU MAKE CHANGES IN THE FILE.

4. SEARCH

Again, being sure your file is in the disk drive, type #4 and the file name, then press CTRL/C.

An empty form (template) should be on the screen. Using the right hand arrow --> move to the item you want to use in your search. The following choices are available to you:

a. whole field search — type in the entire item you are looking for. For example, if you had a 3 letter code, type in the 3 letters you want.

b. partial field search — often used for longer items, .. means to ignore characters. If you are looking for the word "manual" in a long description, type ..manual.. In other databases "word..2 might be called a string, or sub-string search

..word

word..

..word..

c. numeric search — used where greater than >, less than <, or equal to = can be used to sort information.

d. a combination — There is a limit to how many conditions can be met in one search, if you exceed that limit, pfs will tell you. However, you can easily search for conditions in two or three items at once. Just put the right information in the appropriate item boxes (this is why you left the blank spaces in each item so that there would be room for the .. or the >.

(If you have the newer version of pfs you have the additional commands available to you. For the older version people, you will find them available to you on the pfs Report disk.)

e. numeric range — =33..49 selects all numbers from 33 to 49 inclusive. Be sure to include the equal sign (=), or the search won't find anything.

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f. missing characher @ can be used to accept any character in that position. 83/11/@@ will take all dates in November 1983. Since the computer is looking for 2 characters, make sure that November second is entered 83/11/02 not 83/11/2.

g.not meeting specification /=350 will exclude all forms where the value in that item is not 350 (and include all others). /MA will remove all Massachusetts addresses from the selection. /=22..33 will elimate everything from 22 to 33, etc.

When you have completed the description of the conditions of the search, press CTRL/C. A form which meets your conditions will appear on the screen. Notice that it is the last form you entered which meets the condition, pfs sorts backwards through the file. If your form uses two pages, use CTRL/N AND CTRL/P to move between the pages. Press CTRL/C to get additional forms. (If you had wanted to look at all the forms, you would just have pressed CTRL/C when asked for Retrieve specifications.)

You now have the options of making any changes in the form

Move your cursor around as usual, retype and when you are finished, press CTRL/C. Be sure to use CTRL/C (which will save your work rather than ESC which will return you to the main menu without saving the last form. (By the way, many databases do not offer such easy access to changing data. You need to think about the security implications of having the SEARCH and EDIT commands combined.)

You can print out the entire file, press CTRL/O (O=output)

If you decide to print, make sure the printer is connected, the paper feeding properly, the on-line (or comparable) light is on. If the printer is not advancing between lines, press ESC to stop the process. You will need to tell the program that you want a line feed given to the printer. In the older form of the program, press CTRL/L before selecting PRINT. In the newer version, select L instead of P for PRINT FORMAT.

This "dumping" (printing out an entire form) is sometimes useful, but you may want to use the commands available from the PRINT selection on the main menu for more selective printing.

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5. PRINT

Note: You will need to learn both the PRINT command in this program and the pts REPORT system since the commands produce rather different formats. REPORT puts all the information from one form on a single line (not a big help for a mailing label.)

a. Making sure your disk is in the drive, that the printer is on, and the paper feeding properly, type #5 and the file name, then press CTRL/C. Your first experience with PRINT may be a disaster, as your printer may need a line feed command (see previous page.) However, if your printer doesn't need it and you give the line feed command, everything will be double spaced. The Epson needs a line feed.

b. Again you are looking at a blank form. At the bottom on the screen is

FILE (YOUR FILE NAME) RETRIEVE SPEC PAGE 1

If you do not want every form printed out, you need to use the same procedure you used for SEARCH. If you want every form printed out, just type CTRL/C.

c. You are then asked:

PRINT OPTIONS

PRINT ITEM NAMES (Y/N)

LINES PER PAGE 33

(Plus some additional questions on the newer version)

If you select "Y" the labels for each item will be printed out. You might want that for some print formats, but wouldn't want it for mailing labels.

There are 66 lines per page. "33" will put two forms on each pages. For mailing labels you would want about 6.

(With the newer version, ignore the PREDEFINED FORM NAME for now, select F or L depending on your printer, and continue.)

Use the right hand arrow to make these choices, when finished press CTRL/C.

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d. Now you are back to a new blank form. This time the status line at the bottom of the screen says

FILE (YOUR NAME) PRINT SPEC PAGE 1

As you use the right hand arrow --> between items, you have three choices:

leave the item blank:	That item will not be printed
x	That item will be printed and the printer will move to the next line.
+	That item will be printed and the printer will stay on the same line.

In the newer version, you have two additional commands:

S	Sorts alphabetically from the left letters will be A to Z numbers will be 0 to 9 (numbers must all the the same length, in this sort 102 comes before 53 which comes before 9!)
T	Treats an entry as text, uses the the full length of the page and wraps words (breaks them only at spaces)

If you give no print specifications, everything will be printed just as it appears on the screen.

If you have more than one page in the form, use CTRL/N to move to the next page.

When you are finished press (you guessed it) CTRL/C.

If something is wrong with the printing, press ESC. If everything is printing on one line, return to the beginning of this section for directions on how to correct the problem.

For those with the newer version of the program, you can also predefine print formats, if you want to change the format later, bring the format you want to change onto the screen, then use CTRL/E to erase the entries, or CTRL/R to remove the format completely.

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6. REMOVE

Once again, make sure the file disk is in the disk drive, type #6 and the file name, then press CTRL/C.

The purpose of this command is to remove unwanted forms. If you only want to make changes, you would do that using the SEARCH command. Before you become delete-happy, remember that a form (or record) deleted is lost forever. Electronic heaven. If you are using pfs to keep personnel records, at least make a paper copy (hardcopy) of the entire form (you can use CTRL/O when in SEARCH) before you delete completely. Put the paper copy in the dead storage files. Or you may want to keep archival copies of the disks themselves. Make a copy of the entire disk, put the copy in storage, then delete from the active disk.

Assuming you want to erase the information forever:

You are once again faced with a template. Unless you want to remove every single form, specify which form (or forms) you want to delete. You might want everyone with code numbers less than 100, employee ID # 12543, everyone with the last name of Wilson. Consider for a minute how dangerous that might be!

When you are through making your search selection, press CTRL/C.

You are given one last chance, after you press CTRL/C it's all over. Actually, it isn't quite. If you realize you have made a horrible mistake, press ESC IMMEDIATELY. You will only loose the forms that have flashed onto the screen.

HELPFUL HINT #1:

The catalog of a pfs storage disk cannot be listed in the usual way (loading the DOS system master, putting in the disk, asking for CATALOG.) Nothing is listed. It is, therefore, almost impossible to find out the name of a file if you have forgotten to label the disk. There are two solutions that I know of. Load the pfs Report disk, place the unknown filename disk in drive #1, select #1, leave the filename blank, press CTRL/C. The file in the drive will be loaded and the name will appear on the bottom of the screen. If it isn't the file you want, press ESC. Put in a new disk, type #1, etc. A second technique is to label your disks so that the file names can be read by simply loading them directly into the computer.

For some reason the pfs format design process does not erase any BASIC programs already on the disk. Therefore, you can use the following procedure to put an electonic label on your storage disk.

1. Load the DOS System Master, remove the disk.

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2. Put a new (or to-be-recycled) disk in the drive.

3. Type the following

```
NEW

10 PRINT "PFS FILE DISK, FILE NAME:....."

20 PRINT "MY NAME, THE DATE"

30 END
```

(filling in the proper file name, your name and the date)

4. Make sure the program runs by typing, RUN.

5. With the new disk in the disk drive and the door closed, type

```
INIT HELLO
```

(There will be much scrapping and whirring, wait until the light goes out.)

6. Check that the disk works by typing

```
PRNT
```

Label the disk with pfs and the file name, now load the psf File and use this disk to design and add the forms.

Of course, if you later erase the file and use a new name, you will want to change the HELLO program. Just put the file disk in the computer, turn it on. When the light is out, type

```
LOAD HELLO

LIST
```

Write a new line 10 with the new file name, check to make sure it runs, then type

```
SAVE HELLO
```

and the new title will be on the disk.

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Helpful Hint #2:

If you follow the Change of Design directions perfectly, you will finally come to a moment when the file has been redesigned, the screen is quiet (showing Form #1) and the computer is an endless loop between drive one and drive two (lights flashing back and forth.)

a. Press RESET, the computer will go to drive #1 and try unsuccessful to read it, light will stay on.

b. Press RESET again, the computer will go to BASIC with a left-hand bracket and cursor at the bottom left of the screen.

c. Take the disk out of Drive #1. It has your new file on it. LABEL IT CORRECTLY NOW.

d. Put pfs File in drive #1, type PR#6, press RETURN (you are rebooting the program).

e. When the light is out and the main menu showing, put pfs away, put the new disk is drive one, (the disk in drive #2 is just garbage, use for a later file). You are ready to go.

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pfs Report

This program enhances the commands available in pfs File. In order to use it, you need a data disk developed with pfs File, an Apple II, a printer and two disk drives. If you have only one disk drive you cannot use the SORT commands. Without being able to do sorts, the program will be of limited value.

If you have a new pfs Report disk, you may have a Sortwork disk included in the package. If you do not, you will need to create a SORTWORK disk. To do this load pfs File, then put a new disk in drive #1. (If you only have one disk drive, you cannot use the Sortwork program so don't worry about copying it.) Select #1 DESIGN, use SORTWORK as the file name, when you are presented with the design page (blank screen), simply type : and press CTRL/C. When the whirring has stopped, take the disk out of the drive, label it SORTWORK and continue to read this manual.

The purpose of the Report program is to turn your database into a report with up to 9 columns. Three of those columns can be created by mathematical manipulations of the data. Sorting (alphabetic and numeric) can be done in the first two columns and counts, totals, averages (and subcounts, subtotals and subaverages) can be calculated for any column. Very impressive.

Getting Started:

Assuming you have data on a disk which was created using pfs File, load pfs Report in drive #1. Remember that the label should be facing up and at the front, close the disk drive door, turn on the computer (or if you have been in pfs File, put pfs Report in drive #1 and press RESET). When the program has loaded (disk drive light out, writing on the monitor) take the pfs Report disk out and put away safely. Put your data disk in Drive #1 and the Sortwork disk in Drive #2. (If you do not have a second drive, you cannot use the Sortwork disk.) Since you are probably going to do some printing, make sure the printer is on, the paper feeding properly and the ON LINE, or comparable, light is on.

You should now be looking at a screen with 3 choices (this will be called the Main Menu), there should be disks in both drives and the disk drive doors should be closed. Note: when you are finished, return to this Main Menu first (press ESC). If you do not, you may RUIN YOUR FILES.

1. PRINT REPORT

a. This is the main program, type 1. If you remember the file name you can type it in; if you do not, you can leave it blank and the computer will load the file in drive #1. Press CTRL/C. (If you make a typing mistake, use the left-hand arrow <-- and type over or use the spacebar to type blanks.)

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b. You should now be facing the template for your database (a blank form). At the bottom of the screen will be

RETRIEVE SPEC

If you want to select certain forms for this report, now is your chance to do so. Use the same search strategy you would use in pfs File SEARCH. (If you can't remember, return to the File section of this manual.) Keep in mind that this is a SEARCH STRATEGY (i.e. designed to eliminate or select certain records) it is NOT a SORT STRATEGY (i.e. designed to sequence forms.) For your first experiments, don't worry about Search Specifications, simply press CTRL/C and continue.

c. You now are asked to specify Report Options.

Type in a TITLE (up to 32 characters and spaces, it will be centered at the top of the page)

If you had already saved a report form, you could now retrieve it. Since you don't have one yet, leave PREDEFINED REPORT FORM blank

If you want a printed report, you can select P or L for OUTPUT. If you needed L before to print out information, use it here (Epsons need L.) The worse that can happen by specifying P, is that your report will all be typed on one line, which is not easy to read, and you will have to go through this process again selecting L. (If you select L when you don't need it, your report will be double spaced.)

If you only want information on the monitor, select D (D=display) . Right now, you should select D.

Page and line width is standardly 80 columns and 66 lines. If you want a different print-out, change it. If you are just using the monitor, the length will automatically be the length of the screen and you can move across the 80 column screen with CTRL/A (for alternate screens). For now, change the page width to 40 so that you can see everything.

When you are finished, press CTRL/C.

d. Back to a blank form, but this time REPORT SPEC is at the bottom on the screen. Now comes the fun.

To indicate where you want the information to appear on the report, place the number of the column next to the item. You have a maximum of 9 columns available. Keep in mind the number of spaces available to you across the page (or across the monitor.) There are some strategies for shortening titles to help conserve

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space, but for now just keep the problem in mind. If you make your report too wide, you will be told that only when the report is all complete and trying to run.

Sort: Sorting is only done in columns 1 and 2. Sorting is slow, so if you don't want any sorting done, label the first column 3 (if there is no 1 or 2, #3 will be at the left margin.) If you only want one item sorted, label the columns 1,3,4,etc. Sorting can be done:

numerically (highest number will be first), use both a 1 to indicate you want a the sort in the first column and an N to indicate a numeric sort.

alphabetically (first letter of alphabet will be first, or if it is number treated alphabetically the lowest number will be first (starting with the number in the left-hand column.)

Subtotals, subaverages and subcounts are done for the subdivisions created in column 1 only.

In the sorting process, you can type a number of commands next to the column number. These include:

T numeric total for the column

ST numeric subtotal (using the divisions established in column 1) and grand total

A numeric average for the column (When using this remember that 0 is averaged in and a blank is not. Make sure your data is consistent.)

SA same logic as ST

C count of each new entry

CN numeric count of entries (this command will also format the numbers in that column right justified and with 2 decimal places.)

CS same logic as ST

P will start a new page every time the entry in column #1 changes

K keyword sort. This is especially useful in bibiographic databases. Each form appears listed under each keyword. To set up a keyword item, list the keywords with a space (only a space, no comma) between them. Use in column 1.

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If you want to exclude certain forms from the report, remember that you do that in an earlier step in this process (on the Retrieve Spec screen.)

e. In addition to the columns you can pull directly from the forms, you can also create three additional columns of numeric information from your numeric data. (The total number of columns is still 9.)

When you have finished defining the columns you want from the form, press CTRL/D (D=derived columns). First you will be asked to type the heading (if you leave this blank the formula you use will be put in as the heading.)

Then you will be asked to type out the formula. To do this you will need to refer to the column numbers. For example, if this column is to be the total of columns 4 and 5, type #4 + #5. (If you can't remember the column numbers, press CTRL/D to return to the form. Another CTRL/D will return you to the derived column formats. In designing your formula, you need to know that the formula will be evaluated from left to right. You can use two levels of parentheses to change this sequence. You can have three columns of derived formulas, however, the derived formula columns are going to be evaluated from left to right so any column that uses a derived value of another column must be to the right of it (got that?) If you think about some little computer gnome heading across the row doing the work, the reason for this will be somewhat more obvious.

Finally, you are asked for Report Spec, what column the results of the calculations should be in, whether you want totals, average, count, subtotals, etc. Use the same code that you used on the form. When you are through, press CTRL/C.

Possible problems:

Report too wide: ask for a truncated version for the time being. If the problem is the length of the column titles, you can change those (see below). If the problem in the information itself, revise your report.

Sort too long (too much memory required to keep track of both sort columns. Revise your report, maybe not using column 2.

** where numbers should be. Numbers are too big (even one number that is too big will cause this problem.) Too big=more than 20 digits. The problem is probably on the right-hand side of the decimal point. Revise your formula.

I/O error: (I=input, O=output i.e. there is problem with reading a disk.) This may simply mean the disk drive door was not closed, but it may mean disk problems. The chances are high that an I/O error means that data has been damaged. Change to your back-up disk and make a new back-up disk.

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2. PREDEFINE REPORT.

You can define and save 8 report forms for each data disk. Type #2, then press CTRL/C. Use exactly the same commands listed above for Report Spec.

If you should want to change or erase a predefined report form, type 2 and the name of the file. You will have the format in front of you.

To make minor changes, add new information, erase old information by typing over or using the spacebar.

To make major changes, type CTRL/E which will erase the information on the form, but not erase the filename.

To erase the report form completely, type CTRL/R (You will be given a second chance.)

If you can't remember the name of a predefined report form, select #2 from the main menu, the files will be listed; press ESC to return to the main menu.

3. CHANGE HEADINGS

As mentioned earlier, this is an easy way to reduce the column size (when the item name is wider than the information in the column.) It can also be used to make the report more understandable.

The disadvantage of this command is that it overrides whatever you stored in your predefined reports! There does not seem to be any way to avoid this. Therefore, you will probably want to use this sparingly and remember to erase the changes if you don't want them on other reports.

Type #3, file name (or leave blank) and CTRL/C.

With the blank format in front of you, type in the changes next to the item name. When you are finished, press CTRL/C.

To make changes later, type #3, retype, or use the spacebar to erase or type CTRL/R to remove all headings.

BE SURE TO LEAVE THIS PROGRAM BY RETURNING TO THE MAIN MENU (press ESC). Otherwise you may mess up information in your files. You can then leave pfs Report by putting the disk you want to work on in drive one and pressing RESET, or you can turn off the computer. PUT ALL DISKS AWAY CAREFULLY.

(Congratulations!)

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BIBLIOGRAPHY

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Personal Computing, Hayden, 10 Mulholland Dr, Hasbrouck Heights, NJ 07604. Good general focus magazine, helpful summary and evaluation of categories of software.

The Computing Teacher The Journal of the International Council for Computers in Education, University of Oregon, 1787 Agate St. Eugene OR 97403. Again, if you are in elementary or secondary education and can only read one journal about computers in education, this is probably the best (There are many other excellent ones.)

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